WE CLAIM:

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1. A method of equalization across N (an integer, N>1) channels of a multi-channel link of a communications network, comprising steps of:

   a) distributing each one of M (an integer, M>1) data signals across the N channels of the link, such that a substantially equal proportion of each data signal is conveyed through each one of the N channels as a composite data-stream; and

   b) processing the composite data-streams conveyed through the N channels to recover the M data signals;

   whereby performance variations between the N channels are equalized by averaging within each of the M data signals.

2. A method as claimed in claim 1, wherein each data signal is a Forward Error Correction (FEC) encoded data stream.

3. A method as claimed in claim 1, wherein the step of distributing each one of the M data signals across the N channels of the link comprises steps of:

   a) dividing each one of the M data signals into N respective sub-streams of substantially equal length; and

   b) interleaving the sub-streams into respective ones of the N channels.

4. A method as claimed in claim 3, wherein the step of dividing each data signal comprises a step of

inserting a respective predetermined unique identifier into each sub-stream.

5. A method as claimed in claim 3, wherein the step of dividing each data signal comprises, steps of:

   a) partitioning the data signal into a sequential series of data units having a predetermined length; and

   b) forwarding each successive data unit, in turn, to a respective sub-stream.

6. A method as claimed in claim 5, wherein each data unit has a length of one or more bits.

7. A method as claimed in claim 5, wherein the step of interleaving one sub-stream of each data signal into a respective one of the N channels comprises using a sequential interleaving process to:

   a) select a data unit from one sub-stream of each data signal in a predetermined order; and

   b) forward each selected data unit, in turn, to the channel.

8. A method as claimed in claim 1, wherein the step of processing a composite data-stream conveyed through each of the N channels comprises steps of:

   a) dividing each composite data-stream to recover respective sub-streams of each data signal; and

   b) interleaving respective recovered sub-streams of each data signal to recover each one of the M data signals.

9. A method as claimed in claim 8, wherein the step of dividing each composite data-stream comprises steps of:

   a) partitioning the composite data-stream into a sequential series of data units having a predetermined length; and

   b) forwarding each successive data unit to a respective one of N recovered sub-streams.

10. A method as claimed in claim 9, wherein each sub-stream within the composite data stream includes a respective predetermined unique identifier, and the step of partitioning the composite data-stream comprises the steps of:

    a) searching the composite data-stream to locate a unique identifier; and

    b) extracting one or more data units associated with the unique identifier from the composite data stream.

11. A method as claimed in claim 9, wherein each data unit has a length of one or more bits.

12. A method as claimed in claim 9, wherein the step of interleaving respective recovered sub-signals of each data signal to recover each one of the M data signals comprises using a sequential interleaving process to:

    a) select one data unit from each sub-signal of the data signal; and

    b) append successively selected data units to recover the original data signal.

13. A method of conveying M (an integer, M>1) data signals across a multi-channel link of a communications network, the method comprising steps of:

    a) at a transmitting end of the link, distributing each one of the M data signals across the N channels of the link, such that a substantially equal proportion of each data signal is conveyed through each one of the N channels as a composite data-stream; and

    b) at a receiving end of the link, processing respective composite data-streams conveyed through the N channels to recover the M data signals.

14. A method as claimed in claim 13, wherein each data signal is a Forward Error Correction (FEC) encoded data stream.

15. A method as claimed in claim 13, wherein the step of distributing each one of the M data signals across the N channels of the link comprises steps of:

    a) dividing each one of the M data signals into N respective sub-streams of substantially equal lengths; and

    b) interleaving one sub-stream of each data signal into a respective one of the N channels.

16. A method as claimed in claim 15, wherein the step of dividing each data signal comprises a step of inserting a respective predetermined unique identifier into each sub-stream.

17. A method as claimed in claim 15, wherein the step of dividing each data signal comprises, for each data signal, the steps of:

    a) partitioning the data signal into a sequential series of data units having a predetermined length; and

    b) forwarding each successive data unit, in turn, to a respective one of the N channels.

18. A method as claimed in claim 17, wherein each data unit has a size of one or more bits.

19. A method as claimed in claim 17, wherein the step of interleaving one sub-signal of each data signal into a respective one of the N channels comprises using a sequential interleaving process to:

    a) select a data unit from one sub-signal of each data signal; and

    b) forward each selected data unit, in turn, to the channel.

20. A method as claimed in claim 13, wherein the step of processing a composite data-stream received over each of the N channels comprises steps of:

    a) dividing each composite data-stream to recover respective sub-streams of each data signal; and

    b) interleaving respective recovered sub-streams of each data signal to recover each one of the M data signals.

21. A method as claimed in claim 20, wherein the step of dividing each composite data-stream comprises steps of:

    a) partitioning the composite data-stream into a sequential series of data units having a predetermined length; and

    b) forwarding each successive data unit to a respective one of N recovered sub-streams.

22. A method as claimed in claim 21, wherein each sub-stream within the composite data stream includes a respective predetermined unique identifier, and the step of partitioning the composite data-stream comprises the steps of:

    a) searching the composite data-stream to locate a unique identifier; and

    b) extracting one or more data units associated with the unique identifier from the composite data stream.

23. A method as claimed in claim 21, wherein each data unit has a length of one or more bits.

24. A method as claimed in claim 21, wherein the step of interleaving respective recovered sub-signals of each data signal to recover each one of the M data signals comprises using a sequential interleaving process to

    a) select one data unit from each sub-signal of the data signal; and

    b) append successively selected data units to recover the original data signal.

25. A system for of optical equalization across N (an integer, N>1) channels of a multi-channel link of a communications network, the system comprising:

a) means for distributing each one of M (an integer, M>1) parallel data signals across the N channels of the link, such that a substantially equal proportion of each data signal is conveyed through each one of the N channels as a composite data-stream; and

b) means for processing respective composite data-streams conveyed through the N channels to recover the M data signals;

whereby performance variations between the N channels are optically equalized by averaging within each of the M data signals.

26. A system as claimed in claim 25, wherein each data signal is a Forward Error Correction (FEC) encoded data stream.

27. A system as claimed in claim 25, wherein the means for distributing each one of the M data signals across the N channels of the link comprises:

a) means for dividing each one of the M data signals into N respective sub-signals of substantially equal length; and

b) means for interleaving sub-signals into respective ones of the N channels.

28. A system as claimed in claim 27, wherein the means for dividing each data signal comprises means for

inserting a respective predetermined unique identifier into each sub-stream.

29. A system as claimed in claim 27, wherein the means for dividing each data signal into sub-streams comprises:

a) means for partitioning the data signal into a sequential series of data units having a predetermined length; and

b) means for forwarding each successive data unit, in turn, to a respective one of the N channels.

30. A system as claimed in claim 29, wherein each data unit has a length of one or more bits.

31. A system as claimed in claim 29, wherein the means for interleaving one sub-stream of each data signal into a respective one of the N channels comprises, for each channel, a sequential interleaving multiplexor adapted to:

a) select a data unit from one sub-signal of each data signal; and

b) forward each selected data unit, in turn, to the channel.

32. A system as claimed in claim 25, wherein the means for processing a respective composite data-stream received over each of the N channels comprises:

a) means for dividing each composite data-stream to recover respective sub-streams of each data signal; and

b) means for interleaving respective recovered sub-signals of each data signal to recover each one of the M data signals.

33. A system as claimed in claim 32, wherein the means for dividing each composite data-stream comprises:

a) means for partitioning the bit-stream into a sequential series of data units having a predetermined size; and

b) means for forwarding each successive data unit to a respective one of N recovered sub-streams.

34. A system as claimed in claim 33, wherein each sub-stream within the composite data stream includes a respective predetermined unique identifier, and the means for partitioning the composite data-stream comprises:

a) means for searching the composite data-stream to locate a unique identifier; and

b) means for extracting one or more data units associated with the unique identifier from the composite data stream.

35. A system as claimed in claim 33, wherein each data unit has a size of one or more bits.

36. A system as claimed in claim 33, wherein the means for interleaving respective recovered sub-signals of each data signal to recover each one of the M data signals comprises, for each data signal, a respective sequential interleaving multiplexor adapted to:

a) select one data unit from each sub-stream of the data signal; and

b) append successively selected data units in a predetermined order to recover the original data signal.

37. An apparatus for enabling optical equalization across N (an integer, N>1) channels of a multi-channel link of a communications network, the apparatus comprising means for distributing each of M (an integer, M>1) parallel data signals across the N channels of the link, such that a substantially equal portion of each data signal is conveyed through each one of the N channels.

38. An apparatus as claimed in claim 37, wherein each data signal is a Forward Error Correction (FEC) encoded data stream.

39. An apparatus as claimed in claim 37, wherein the means for distributing each of the M data signals across the N channels of the link comprises:

a) means for dividing each one of the M data signals into N respective sub-streams of substantially equal length; and

b) means for interleaving the sub-streams into respective ones of the N channels.

40. An apparatus as claimed in claim 39, wherein the means for dividing each data signal comprises means for inserting a respective predetermined unique identifier into each sub-stream.

41. An apparatus as claimed in claim 39, wherein the means for dividing each data signal into sub-streams comprises:

    a) means for partitioning the data signal into a sequential series of data units having a predetermined length; and

    b) means for forwarding each successive data unit, in turn, to a respective one of the N channels.

42. An apparatus as claimed in claim 41, wherein each data unit has a length of one or more bits.

43. An apparatus as claimed in claim 41, wherein the means for interleaving one sub-stream of each data signal into a respective one of the N channels comprises, for each one of the N channels, a sequential interleaving multiplexor adapted to:

    a) select a data unit from one sub-signal of each data signal; and

    b) forward each selected data unit, in turn, to the channel.

44. An apparatus for enabling optical equalization across N (an integer, N>1) channels of a multi-channel link of a communications network, in which a substantially equal portion of each one of M (an integer, M>1) data signal is conveyed through each one of the N channels, the apparatus comprising means for processing respective composite data-streams received over the N channels to recover the M parallel data signals.

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45. An apparatus as claimed in claim 44, wherein the means for processing a respective composite data stream received over each of the N channels comprises:

    a) means for dividing each composite data-stream to recover respective sub-streams of each data signal; and

    b) means for interleaving respective recovered sub-streams of each data signal to recover each one of the M data signals.

46. An apparatus as claimed in claim 45, wherein the means for dividing each composite data-stream comprises:

    a) means for partitioning the bit-stream into a sequential series of data units having a predetermined size; and

    b) means for forwarding each successive data unit to a respective one of N recovered sub-streams.

47. An apparatus as claimed in claim 46, wherein each sub-stream within the composite data stream includes a respective predetermined unique identifier, and the means for partitioning the composite data-stream comprises:

    a) means for searching the composite data-stream to locate a unique identifier; and

    b) means for extracting one or more data units associated with the unique identifier from the composite data stream.

48. An apparatus as claimed in claim 46, wherein each data unit has a size of one or more bits.

49. An apparatus as claimed in claim 46, wherein the means for interleaving respective recovered sub-signals of each data signal to recover each one of the M data signals comprises, for each one of the M data signals, a respective sequential interleaving multiplexor adapted to:

a) sequentially select one data unit from each sub-stream of the data signal; and

b) append successively selected data units in a predetermined order to recover the original data signal.